

Top right female *Anchiale* sp., top background male *Anchiale* sp.  
 Bottom left female *Pustrocarausius*? sp., bottom right male *Pustrocarausius*? sp.

# METAMORPHOSIS

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# PLANNING AND ORGANIZING COMMITTEE 2018

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## PLANNING AND ORGANIZATION MEETINGS

A quarterly meeting is scheduled in order to plan club activities and the magazine.  
See BOIC Programme.

## CONTACT ADDRESS AND MEMBERSHIP DETAILS

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PO Box 2113, Runcorn, Queensland 4113

Membership fees are \$30 for individuals, schools, and organizations.

## AIMS OF THE ORGANIZATION

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

## MAGAZINE DEADLINES

If you wish to submit an item for publication the following deadlines apply:

March issue – February 1<sup>st</sup>                      June issue – May 1<sup>st</sup>

September issue – August 1<sup>st</sup>      December issue – November 1<sup>st</sup>

All articles should be submitted directly to the Editor [daphne.bowden1@bigpond.com](mailto:daphne.bowden1@bigpond.com)

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## FROM THE PRESIDENT

I am sure that you will find much of interest in this edition of our magazine and my following comments do not seek to weight the importance of any article above another. There are some wonderful achievements reported.

Carol and Trevor Deane's report on the results of their vision and work on their property at Dorrigo, NSW is truly uplifting. You will read that it is not a short term, spur of the moment project, but a well thought out plan, brought to fruition over the past 13 years. The Deane's have constructed a website which is well worth a prolonged visit. (<http://butterfliesdorrigo.weebly.com>)

You will find a brief report on a joint invertebrate survey at the Samford EcoCorridor in February. The habitat restoration has been well planned and significant. It would be great to hear from members of other such initiatives.

Wesley Jenkinson now holds the record for the greatest number of butterfly life cycle reports published by the BOIC, Kelvyn Dunn again reminds us of the detailed observations that must be made by the dwindling number of field observers, and John Moss tells us that there are new observations to be made in our own gardens.

Finally, a big thank you to Trevor Lambkin and his grandson Alexander Davies for sharing a glimpse of the warm tropics on Dauan Island and of their finding of two new species of stick insect there. Alexander has demonstrated his considerable interest and skill in the production of our cover image. Best wishes Ross

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## Two new stick-insects (Phasmida: Phasmatidae) from Dauan Island, Torres Strait, Qld – T.A. Lambkin and A.A. Davies

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### INTRODUCTION

Torres Strait is the body of tropical water that separates Papua New Guinea (PNG) from the northern tip of Queensland. The strait is on a shallow continental shelf between New Guinea and Australia that connects the Arafura Sea to the west with the Coral Sea to the east. The current formations of the islands were established around 5800 years ago, and prior to this the Sahul Land Bridge connected New Guinea to Australia (Willmott 1972, Lavery *et al.* 2012). The strait is roughly 150km wide in a north south direction, covers an area of about 48,000km<sup>2</sup> and is bounded by the 9° and 11° S coordinates and the 142° and 144° E coordinates, and has ocean depths of mostly 15m or less (Torres Strait Regional Authority 2018). The Torres Strait islands now form a complex array of mostly continental shelf archipelago islands distributed irregularly across the strait, which vary in their geology, topography and floral composition. Torres Strait has approximately 280 islands, islets, coral reefs and cays of which 17 are inhabited.

All the Torres Strait islands lie within the political boundary of Australia, with the northern boundary being very close to the southern coastline of PNG. Thus, several inhabited islands, *viz.* Boigu, Saibai and Dauan, lie within 10km of the coast of PNG with the closest being Saibai Island, at roughly 5km from the coast. Dauan Island is the smallest island of this group and is covered with an array of floral biotypes, but the vegetation of the island mostly consists of deciduous monsoon forest and semi-evergreen mesophyll vine forest (Webb 1959, Torres Strait Regional Authority 2013) (Figs 1-4), which grow extensively amongst exposed granite boulders. In addition, there are open grasslands with the palm *Livistona muelleri* F.M. Bailey (Dowe 2010) (Fig. 5), mangroves, and abandoned garden areas near habitation (Figs 6-7) and the only small permanent creek on the island at the eastern end of the village with the palm groves of *Cocos nucifera* L. and *Nypa fruticans* Wurmb (Dowe 2010) (Fig 8). The highest part of the granite boulder stack is Mt Cornwallis at 275m. Dauan Island has a tropical monsoon climate with almost all rain falling between December and April.

Dauan Island of late has become a hot spot for butterfly workers, with many significant discoveries made over the last 15 years. Unfortunately, most other insect groups from the island have been largely neglected. Due to the remoteness of the island, travel to the island can often be logistically difficult, and this may partially explain the general absence in the study of most other insect groups from the island.





The stick and leaf insects, known as phasmids are one of the little known Australian insect groups (Brock and Hasenpusch 2009). There are currently around 100 described species known from Australia with a true number estimated to be between 150 and 200 (Brock and Hasenpusch 2009). Even basic information about phasmids is relatively unknown, especially their biology and hostplant preferences. There are no records of phasmids from Dauan Island, but in January of 2014 and 2018, visits were made to the island to survey butterflies; while in 2018 the herpetological fauna of the island was additionally surveyed. Thus in 2018, we primarily investigated the northern village side of the island and surveyed the southern side of a saddle that runs from the top of Mt Cornwallis to the eastern end of the island. While there, we also searched for phasmids and discovered two, possibly undescribed species that were previously unknown from Australia. Considering the overall paucity of knowledge of most insect groups from the island and its proximity to PNG, it is not surprising that these two new species were discovered. This paper reports on these two species, illustrates both sexes of each including their eggs, and presents field data on their ecology and host plant preferences.

## IDENTIFICATION

The two species discovered (with their eggs illustrated) were:

1. A species that is stick like in appearance, males are quite colourful with peach to cream heads and green bodies with red legs; while females are brown in colour, mottled on the dorsal surface and paler brown laterally, and possess two small horns on the head; both sexes lack wings and have quite long antennae that reach at least to the tip of the foreleg (Figs 9, 10, 13, 15).
2. The other species is relatively large, males slender, brown with large mottled wings, and the females robust, predominantly green with reduced wings (Figs 11, 12, 14, 16).

We made a provisional identification of the larger species as a species of *Anchiale* Stål, based on its relatively large size, possessing cone-shaped tubercles on the mesonotum (Fig 11), and the operculum reaching the end of the abdomen in the female, and the cerci in the male being large and leaf-like (Fig 14) (Brock and Hasenpusch 2009). The species did not fit the key to *Anchiale* provided in (Brock and Hasenpusch 2009) while the smaller stick like species resembled *A. mercurius* (Brock and Hasenpusch 2009). Thus, images of the two species were sent to J.W. Hasenpusch and P.D. Brock (pers. comm.) for identification and they agreed that the two species were unknown to them. They believed that the slender, wingless one was much like the genus *Austrocarausius* Brock 2000, but not exactly, and they agreed that the large species was an unknown species of *Anchiale*. Hasenpusch and Brock (pers. comm.) further indicated that studies of the eggs and DNA barcoding of the slender wingless species would be required to assign it to a genus. For convenience in this paper, we have provisionally named the *Anchiale* sp. the ‘Dauan Island mega stick’ and the species nr. *Austrocarausius* as the ‘Living Twig’.



## OBSERVATIONS AND DISCUSSION

The ‘Dauan Island mega stick’ (*Anchiale* sp.) was found only in areas of dense forest that mostly ground amongst granite boulder outcrops, viz. the deciduous monsoon and semi-evergreen mesophyll vine forest, dense undergrowth under an upper storey of mango trees, dense coastal thicket, and wind-swept forest on the southern side of the island which is dominated by *Ptychosperma macarthurii* (H. Wendl. ex H. J. Veitch) H. Wendl. ex Hook. F), the Macarthur palm (Dowe 2010). Three adult females were observed and two of these were collected off overhanging branches of *Terminalia muelleri* Benth, and from a small rainforest plant within the mango forest environment. The third was observed high up in a mango tree near the village road, which indicates that the females are quite vagile. A juvenile was also observed on a rainforest sapling within the mango environment. Several males were observed on the southern wind-swept side of the island flying amongst *P. macarthurii*; one was observed also flying along the edge of the monsoon vine forest, one was attracted to light near the forest edge, while one was observed sitting on a boat near the water’s edge.

The ‘Living Twig’ (sp. nr. *Austrocarausius*) was common and ubiquitous in all areas that we visited on the island. They were sometimes observed in relatively high numbers on single plants, particularly on the new growth of *Premna serratifolia* L.; where on two individual small plants of *P. serratifolia* >20 individuals were counted on each plant. ‘Living Twigs’ were particularly active and would often be seen at night walking across roads, granite boulders and up the sides of buildings. They are very stick-like, and when they fold their legs in tightly against their body and rest on the underside of leaves and on twigs they are almost impossible to detect.

The genus *Anchiale* contains 12 described species, all from the Australasian area with three species occurring on the Australian mainland (Brock and Hasenpusch 2009), viz. the Tessellated stick-insect (*A. austrotessulata* Brock & Hasenpusch, 2007)) is a common species around Brisbane, the Strong stick-insect (*A. briareus* (Gray, 1834)) from the Wet Tropics, and the Spiny Anchiale stick-insect (*A. spinicollis* (Gray, 1833)) which has a patchy distribution in drier parts of northern Queensland and in the Top End. It appears that little is known regarding the true distributions of these species, thus it is possible that the ‘Dauan Island mega stick’ (*Anchiale* sp.) may have a far more-reaching distribution in PNG and Australia than what we currently know. The ‘Living Twig’ (sp. nr. *Austrocarausius*) is equally mysterious, as it is difficult to understand how such a commonly observed species on Dauan could remain undetected till now. Thus, it is possible that it may also occur further afield than Dauan Island. The two species of true *Austrocarausius* are also seldom reported but *A. mercurius* from eastern Australia, like its congener on Dauan Island is also said to be active at night (Brock and Hasenpusch 2009).

With such a paucity of information on the phasmids of Torres Strait, one may question our readiness to detect a potential incursion of the Coconut stick-insect,



*Graeffea crouanii* (Le Guillou, 1841) (a coconut pest in the Pacific) if it moves through PNG to Torres Strait (Pestnet 2018). Certainly, more surveying and monitoring of all insect groups, including phasmids, through Torres Strait would be prudent and rewarding research.

## Acknowledgements

We thank the Dauan Island Council for approval to enter and stay on the island. In addition, we thank Queensland Department of Education for the provision of their guest house for our stay on the island. Appreciation is extended to P.D. Brock and J.W. Hasenpusch for their provisional identification of the two species and for their personal communications.

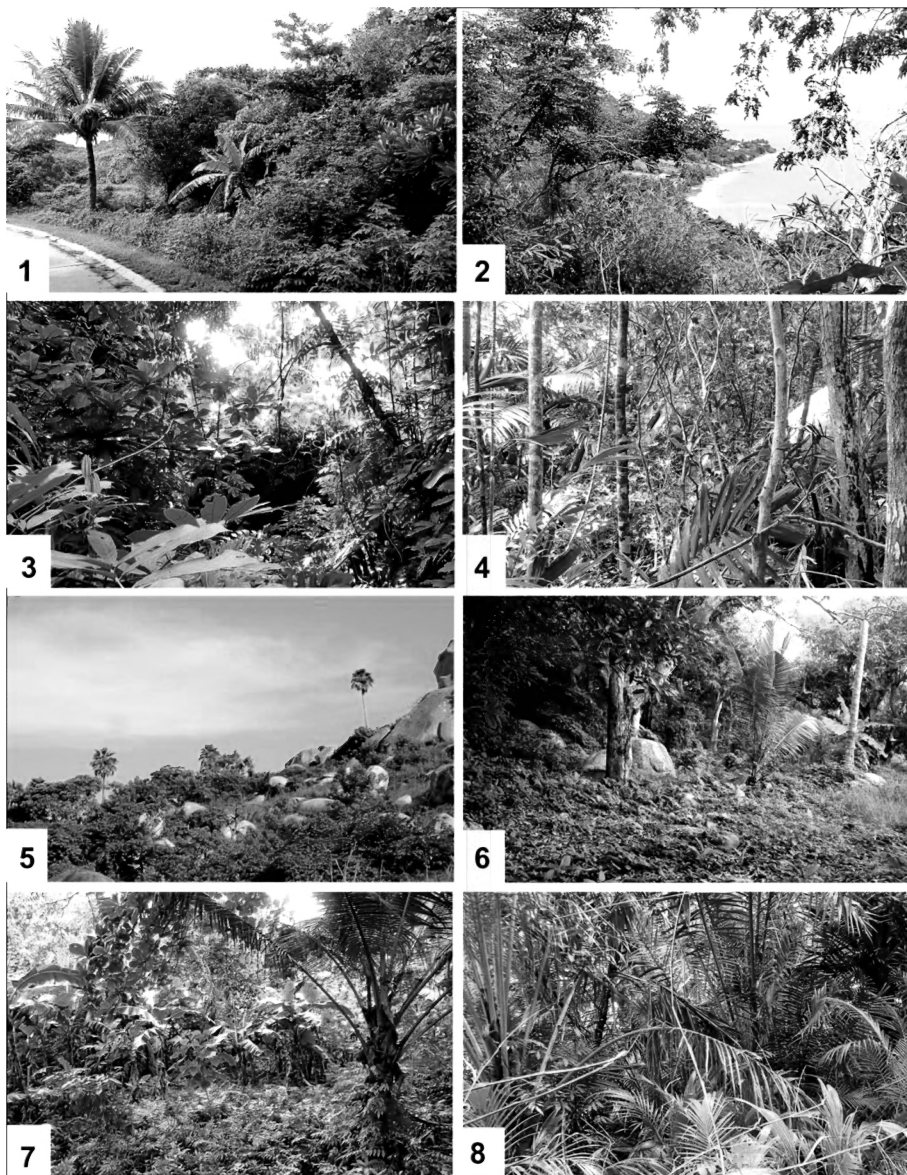
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## Cover Drawing

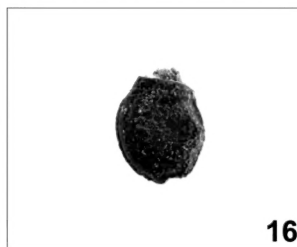
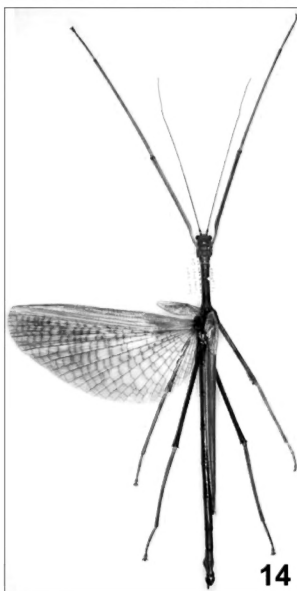
The image depicts an adult female "Dauan Is. Mega-stick" atop a rain forest sapling on the edge of the mango forest, along with a male and a female "Living Twig". The edges of the forest are ideal for stick-insects as they are not only good for finding new growth but also for keeping an eye out for potential mates. In the background a male Dauan Is. Mega-stick is seen flying above the canopy (a typical diurnal behavior); though this male is about to make a big mistake as an Emerald Tree-monitor is cryptically camouflaged behind some basket ferns on a mango tree. – Drawing by A.A. Davies





**Figs 1-8.** Biotypes Dauan Is., Torres Strait, Qld: (1-4) deciduous monsoon forest and semi-evergreen mesophyll vine forest, some with anthropogenic disturbance, (5) open grasslands with *Livistona muelleri*, (6, 7) abandoned garden areas near habitation, (8) *Nypa fruticans* and *Cocus nucifera* grove.





**Figs 9-16.** Phasmida Dauan Is., Torres Strait, Qld. All figures not to scale: (9, 10, 13, 15) *Austrocarausius*? sp.; (11, 12, 14, 16) *Anchiale* sp. (Body lengths [12] 180mm, [13] 90mm, [14] 120mm; Egg lengths [15] 3mm, [16] 5mm.

Photos A.A. Davies and T.A. Lambkin



## PRESIDENT'S REPORT TO 2018 AGM

I feel that time passes more quickly as we age, and another year seems to have flown quickly.

Our quarterly magazine, “Metamorphosis Australia”, remains at the core of the club and is the primary means of sharing the observations and thoughts of our contributors with all of our members. I appreciate that, as the magazine editor, Daphne often has concerns about whether there will be enough copy for the next edition. Somehow, she assembles the articles and produces a fine edition on time. We really do need your contributions to keep flowing in.

The rather lengthy process of updating the club constitution was completed last year and I wish to thank Dawn for steering the final product through to its final acceptance by the relevant bureaucrats.

Dawn was also instrumental in preparing designs for our new club banner, obtaining quotes and finally organising its production. The banner is now on display at this meeting.

At our planning meeting last May, there was discussion of possible means of getting younger people more involved with invertebrates. Further exchanges of ideas at subsequent meetings led us to decide on a photographic competition so that, with the wonderful co-operation of the staff of the Toohey Forest Environment Education Centre, details of that competition will be publicised later this month. Generous prizes are on offer but, of course, we will not be able to gauge the response until the closing date for entries in late June.

There has been a welcome sense of greater interest and involvement by more club members in the last year. This may be attributed to the fact that our quarterly meetings are open to all and are followed by an interesting guest speaker or activity. I believe that there is also a sense of greater positive harmony within our management.

I have often spoken of Daphne as the heart of our club and she remains thus. Last year we added another heart in the form of our secretary Dawn. Dawn's energy and attention to detail in all that she does has added a new dimension to the “management” – she certainly keeps this old drifter on track at times!

Reports on our few excursions have been made in our magazine so I will not repeat them. This is not to say that the situation has been satisfactory for we really need to do more to introduce new members to field activities. It has been decided that, rather than having a single excursion convenor, we invite interested members to lead an excursion to their special place, so we invite you to make suggestions at any time.

Public displays of our books and posters are a very useful means of opening contact with the wider public and the assistance of any member is very welcome at any time.



I'm not very familiar with Facebook, but we have several hundred members of the BOIC group. Many posts are made every week and it has become a popular spot for the sharing of images or for requests to identify caterpillars etc.

Many thanks to all who have helped in the past year. I look forward to the coming year with great optimism.

*Ross Kendall*

## ITEMS OF INTEREST

### **Queensland Museum Entomology** – *Chris Lambkin*, Curator of Entomology, Queensland Museum

Queensland Museum (QM) has five branches across the state; QM South Bank (Brisbane), QM Hendra Annex (Loans & Geosciences, Brisbane), Museum of Tropical Queensland (Townsville), Cobb & Co (Toowoomba), and The Railway Museum (Ipswich), that over 2 million people visited in 2017. The state-wide loans service for school education kits at Hendra covers an area from Cape York, west to Cloncurry, and south to the NSW border interacting with over 800,000 people each year.

QM staff complete research on biodiversity, geosciences, cultures and histories, publish wildlife, historical and children's publications, produce online learning resources for schools, and answer public enquiries – over 23,000 queries some years.

#### **QM Entomology**

As you would all know, 75% of land animals are insects, with estimates of 200 000 species in Australia, of which approximately 30% have formal scientific names.

The QM Entomology Collection covers all groups of insects, includes roughly 4 million dry pinned specimens, microscope slides and alcohol preserved material; is temperature and humidity controlled, has an Inergen fire retardant system, and uses Naphthalene as a pest deterrent.

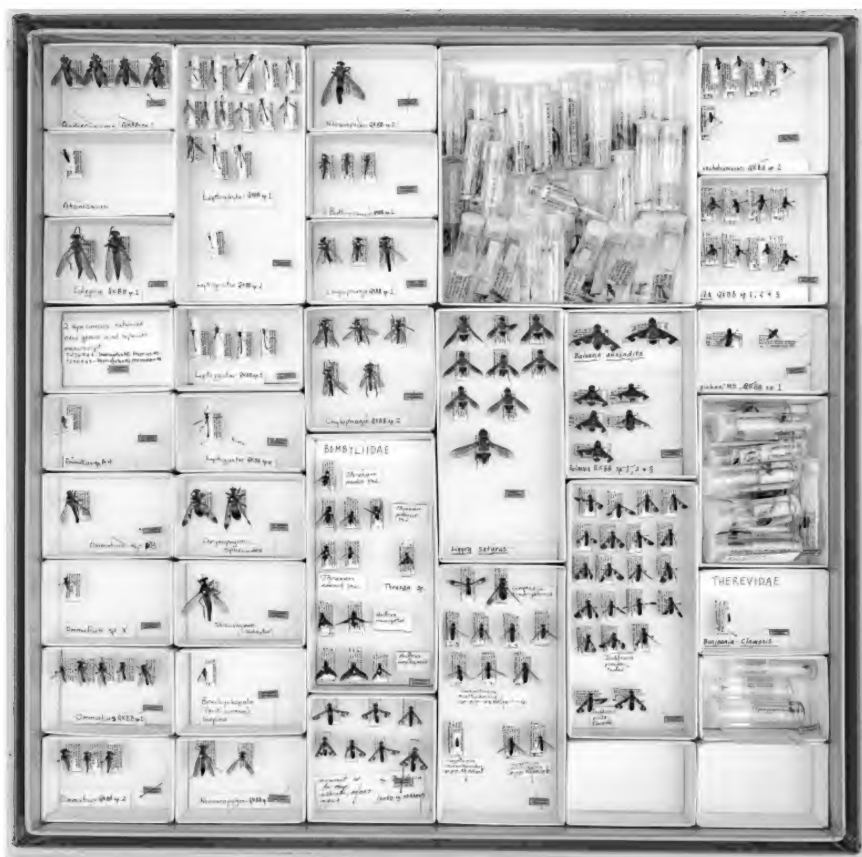
The QM Entomology section currently has three full-time staff; curators Drs Chris Burwell and Chris Lambkin, and collection manager Susan Wright, and part-time assistant collection manager and databaser Karin Koch. We also have many honoraries - including Geoff Monteith, Greg Daniels, Peter Allsopp, Tony Ewart, Judy King, and John Lawrence.

#### **Field Work**

Funded by environmental consultancies we collaborate with other QM sections working on spiders, snails, and vertebrates; external agencies and companies such as Brisbane City Council and BHP Billiton to collect specimens from areas previously not surveyed. The insect groups targeted, based on our areas of expertise, include ants (Formicidae), beetles (Coleoptera), flies (Diptera), dragonflies (Odonata) and butterflies (Lepidoptera). All residues are labelled, stored, and made available for future study by specialists across the world.



For example, following the 10-day March 2017 Bush Blitz survey of Quinkan near Laura in NQ we registered (every specimen with a unique number, identified to species, all data digitised) 1545 insect specimens for QM collected from 34 sites in six properties. Bush Blitz is Australia's largest nature discovery project; a multi-million dollar partnership between Australian Government through Parks Australia, ABRIS, BHP Billiton, Sustainable Communities, and Earthwatch Australia to document plants and animals across Australia. At the Quinkan Bush Blitz 307 species were collected including dragonflies (23 species) and damselflies (18 species), butterflies (62 species), flies (77 species), cicadas (19 species), ants (99 species), and moths (9 species). Range extensions were made for dragonflies (2 species) and damselflies (1 species), flies (6 species), cicadas (11 species), and ants (3 species).

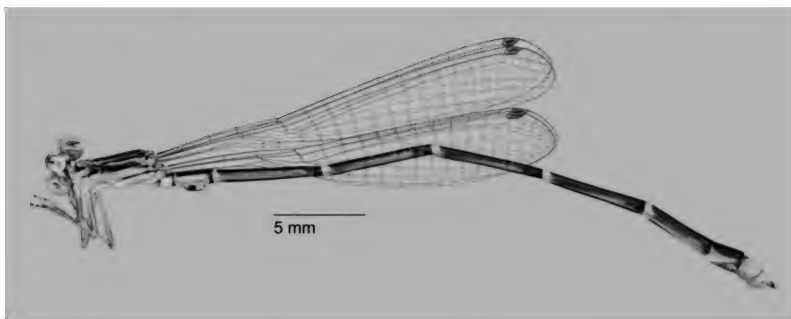


**Figure 1.** Drawer of databased QM pinned material collected from Quinkan Bush Blitz holding Diptera (flies) including Bombyliidae (bee flies), Asilidae (robber flies), and Therevidae (stiletto flies). Photo Geoff Thompson, QM.





Species new to science included damselflies (1 species), flies (25 species), and cicadas (2 species). The damselfly from the genus *Oristicta* has now been described—the first Australian Odonatan described for 10 years.



**Figure 2.** The Holotype male of the elegant wire tail, *Oristicta rosendaleorum* Theischinger & Burwell, the new Australian damselfly. Image Geoff Thompson, QM.

### Donations

Through donations, QM holds many important collections including the iconic Dodd Collection, the scientifically important Girault Collection; the Knight, Franzen, Johnson, and De Baar butterfly collections; and the University of Queensland Insect Collection.

Alexandre Arsene Girault was an American entomologist whose speciality was minute parasitic wasps, and also published on thrips and bugs. He worked in Australia 1911-1914 and moved here in 1917. QM has the bulk of his type collection of pinned and slide-mounted wasps and thrips - at least 10,000 specimens. Types are the name holding specimens for a species, scientifically invaluable and almost irreplaceable. Unfortunately, Girault's work is marred by confusion compounded by his habit (due to financial constraints) of mounting more than one specimen (even multiple types) on one slide or card. As microhymenoptera are increasingly studied for use in biological control programmes all over the world the Girault collection is unique and priceless, the types are a taxonomic keystone and the information within vital for scientific research.

### Exhibitions

One of our recently developed displays is the free, permanent exhibition – Wild State – that takes visitors through five breathtaking environments; the arid outback, iconic eucalypt forest, tropical rainforest, sun-drenched coastal zones and teeming marine environments. QM Entomology staff and volunteers were heavily involved in the creation of three of the five habitats; myself for the arid outback, Susan for the eucalypt forest, and Chris Burwell for the tropical rainforest.





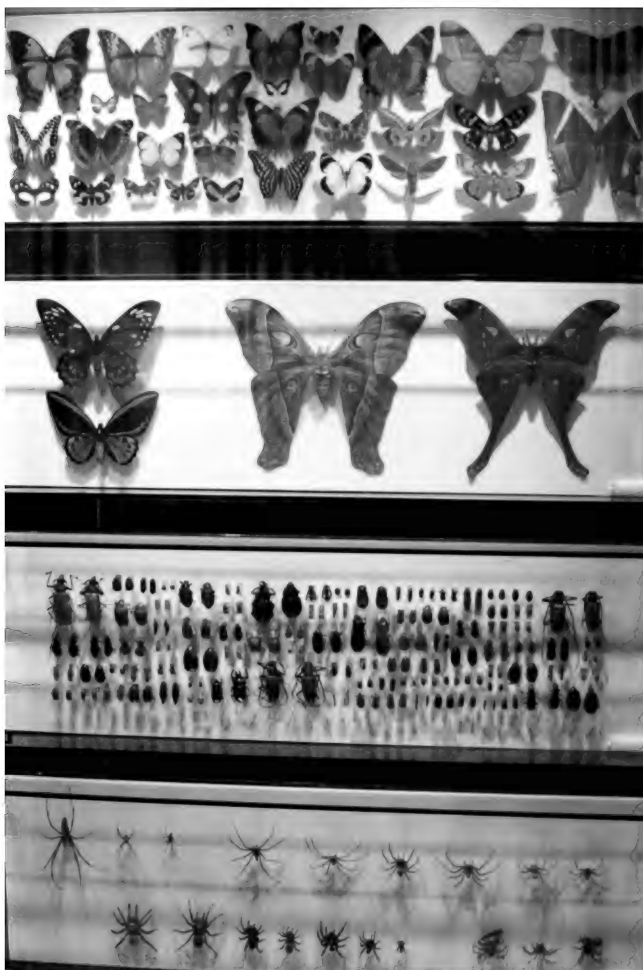
**Figure 3.** Insects in the Arid Outback section of the Wild State exhibition. Photo N. Starick.



**Figure 4.** Insects in the Open Forest section of the Wild State exhibition. Photo L. Popple.



**Figure 5.** Some of the invertebrates on display in the Rainforest section of the Wild State exhibition. Photo N. Starick.



### What else we do

QM Entomology staff curate and preserve the insect collection, and produce displays. We also conduct research, both taxonomic and ecological; produce publications, webpages, and factsheets; supervise students; answer enquiries and carry out identifications.

We also provide access to the collection: through loans of specimens to scientists (16,500 specimens in 2016); digitally through the QM website, Atlas of Living Australia (nearly 253,000 specimen records), and images; physical access

to researchers, students, artists, writers, photographers, journalists, teachers, naturalists and environmental groups; and through talks and lectures.

\*\*\*\*\*

### New Observations of the Pale Ciliate-blue butterfly, *Anthene lycaenoides godeffroyi* (Semper)– John T Moss

Since January 2015 there have been a number of reports of observations of the Pale Ciliate-blue lycaenid butterfly in southeast Queensland. Common and Waterhouse (1981) reported their distribution as the Top End of the Northern Territory and from Cape York to Townsville. Braby (2000) extended this east coast distribution further south to Cannonvale near Proserpine. Dunn (2008) later reported a sighting of a



female at Tannum Sands (near Gladstone) in January 2002, but as the butterfly evaded capture its identification was not confirmed.

The butterfly is polyphagic and Braby (2000) lists a number of host plants in seven or eight families. So far in southeast Queensland it has only been reported feeding on plants in the families Mimosaceae and Caesalpiniaceae. Several people including Amelia Pasieczny (2015), Ross Kendall and myself have observed them using *Senna gaudichaudii* (Caesalpiniaceae) in our Brisbane and Redlands gardens. Wesley Jenkinson noted that in his Beaudesert garden they utilised both *Albizia lebbek* (Mimosaceae) and *Cassia fistula* (Caesalpiniaceae) [Jenkinson, 2017]; but since then he found two final instar larvae of the butterfly, attended by several small black ants, on a *Senna surattensis* shrub in his garden. These pupated and emerged successfully as adult butterflies. Mayo (2015) was the first to report the butterfly in this region (from three locations on the Sunshine Coast). One of these observations was in association with the exotic *Albizia julibrissin*.

For the 3 years from the 24<sup>th</sup> December 2015, Wesley (pers comm) has regularly observed adult butterflies in his garden from late December through to early March and recently on 18<sup>th</sup> April 2018 (new record) . He also observed a specimen on the 5<sup>th</sup> May 2017 in the Brisbane suburb of Marsden. These records and the following observations show that the butterfly is likely to have at least two generations a year in southeast Queensland.

Recently (first week of May 2018), here in the Redlands, I noted the butterfly flying around exotic *Calliandra* species (Mimosaceae) both in my garden and that of Lois Hughes. Lois also has a large *Senna gaudichaudii* shrub near the former, so it is likely that the butterfly will be using both species. Braby (2000) lists all these as recorded host plants. The butterflies observed were fresh females, so it is assumed they are breeding locally in our gardens.

With the exception of one observation, so far only females have been collected or observed in this region, which makes some sense as they were on or near their host plants. Another reason that females are reported is that they are more noticeable and recognisable, particularly in bright sunlight, due to the small pale patch on their forewing upperside, which transmits light through to their underside. This is clearly seen when observed side on with wings closed [see photo herein].

Braby (2000) states that the butterfly is usually attended, in a facultative myrmecophilous (loose) association, by a number of ant species, or sometimes is unattended. The related Dark Ciliate-blue (*A. seltuttus*) is obligate myrmecophilous, meaning it has a tight relationship with its ant companion, the Green Tree-Ant (*Oecophylla smaragdina*), and is unlikely to function without its presence [for more details see Eastwood and Fraser, 1999]. As these ants currently only occur along the Queensland coast south to the Gladstone region, this is thought to limit the spread of this butterfly.





*Anthene lycaenoides* (Pale Ciliate-blue)  
Male



*Anthene lycaenoides* (Pale Ciliate-blue)  
Female

It now appears that *Anthene lycaenoides* has established itself in southeast Queensland and is currently known to feed on at least 6 plant species in the two families Caesalpiniaceae and Mimosaceae. No doubt further observations will reveal other plant species in these and other genera as listed in Braby (2000) and field guides. It remains to be seen what species of ants it becomes associated with in this region.

#### Acknowledgements:

Wesley Jenkinson supplied the two butterfly images from photos taken in his Beaudesert garden and kindly provided details of his more recent personal observations of the butterfly. Kelvyn Dunn offered some useful comments.

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## Life history notes on the Dingy Grass-skipper, *Toxidia peron* (Latreille, [1824] Lepidoptera: Hesperiiidae – Wesley Jenkinson



In part due to recent DNA evidence, a new taxonomic arrangement by Andrew Atkins has moved the species *Toxidia peron* to *Signeta peron* (Atkins, 2012). This arrangement has not been followed in a current popular field guide (Braby, 2016).

This endemic skipper is frequently encountered along much of eastern Queensland including areas west of the Great Dividing Range south into Victoria.

In South-eastern Queensland this aptly named species is generally the most common skipper occurring in a varied range of habitats. The main preference is eucalypt open forest but can also be found in coastal heathland, dry vine forest, sclerophyll forest, woodland and suburban gardens where it is associated with tall grasses.

The adults can be confused with many of the ‘brown’ skippers. The broad black sex brand on the male helps to separate other male *Toxidia* spp. The females are rather similar to other *Toxidia* spp. but are larger in size. For observers with experience, the adults can be correctly identified in the field but it is preferable to retain voucher specimens where in doubt.

Within Queensland, individual specimens show little variation. The faint underside rings may be reduced to spots.

Adult flight is very rapid. While basking they typically settle in a ‘skipper’ pose with their wings open, facing towards the sun, revealing the upper side markings. Males can be observed strongly defending open glades (where the host grasses are present), chasing off other males and typically returning to the same perching spot. The females also frequent the same areas looking for suitable ovipositing sites. The males hilltop and can perch up to several meters high on live vegetation, dead sticks and less frequently settle on rocks or bare ground. Both sexes are readily attracted to a wide range of small native and exotic flowers. Whilst feeding, the wings may be open or closed. During cloudy conditions, they settle on vegetation with the wings closed.

Wingspans for the pictured adult specimens are: males 28mm and females 30mm.

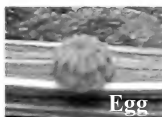




### ***Toxida peron* (Dingy Grass-skipper)**

Images left to right: male, female, male underside, female underside

At Beaudesert in South-eastern Queensland during September 2006, a female fluttered slowly around a patch of exotic Prairie Grass (*Bromus catharticus*, Poaceae) and briefly settled on a stem. She then walked a short distance and curled her abdomen to the underside of this leaf and laid a single egg. The wings remained closed while ovipositing occurred. This egg was collected and was successfully raised in captivity through to an adult on this host grass. This observation was at midday in warm sunny conditions. Eggs are generally laid below a grass leaf or occasionally on debris near the host plant. The females have a preference to oviposit in a cooler, protected, dappled sunlit area, below trees where soft tall grasses are growing.



The collected egg was 1mm wide x 0.7mm high, dome-shaped, 13 longitudinal ribs, cream colour when laid, with pinkish-red apex and mottled lateral band and markings appearing after 2 days.



Early instar with chewing next to shelter

The first instar larva emerged at dawn and soon consumed the eggshell. It later commenced constructing its shelter and was resting in it by 10.15am. Being on soft thin leafed grass, the shelter was formed by stitching a silken thread across a leaf and tensioning the silk to roll the leaf edges in towards the centre. The shelter was then later lined with silk and was slightly longer than the length of the larva. The shelter was formed approximately one third of the distance below the leaf apex. The early instar larva consumed a small section from the outer edge of the leaf, near the shelter at dusk. During the 1<sup>st</sup> or 2<sup>nd</sup> instar (time not noted) the leaf was folded over itself and the edges

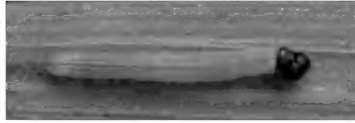
stitched together as per above image. The larger instar created another shelter with several leaves stitched together in a parallel formation to form a shelter along the bottom edge of the container which became the final shelter. It was observed feeding after dusk consuming a section of leaf starting from the outer edge.

On wide leafed mat rushes such as *Lomandra longifolia* the mature larvae form their shelters towards the base of two leaves, feeding above the shelter. While resting in the shelter the head was in an upright position. The larva completed five instars and attained a length of 30mm.

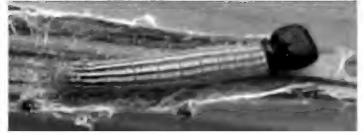




1<sup>st</sup> instar larva



2<sup>nd</sup> instar larva



3<sup>rd</sup> instar larva



4<sup>th</sup> instar larva



5<sup>th</sup> instar larva



Pupa

The pupa, measuring 18mm in length, was partially covered in a thin layer of white waxy powder. It was located in the final shelter and was attached with silk by the cremaster.

Egg duration was 11 days, larval duration was 83 days while pupal duration was 17 days.

Within the new boundary of the Scenic Rim Regional Shire south of Brisbane, I have records of adults from August through to June, being more numerous during spring, late summer and early autumn. In

this district, emergence periods indicate there are two main generations per year.

Again I would like to thank John Moss for commenting on the manuscript.

Photos Wesley Jenkinson

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## Rainforest regeneration helping butterflies and moths – Carol and Trevor Deane

We were interested to read Ross Kendall’s comment in the March issue reminding us that “the major goal of the club is concern for the maintenance and the restoration of habitats”. This is what we are aiming to do here on our 20-acre ex-cattle property on the Dorrigo Plateau, on the NSW Mid North Coast, a project we commenced in July 2005. With a deep passion for the environment, rainforest and lepidoptera in particular, it is proving the perfect retirement project for us.

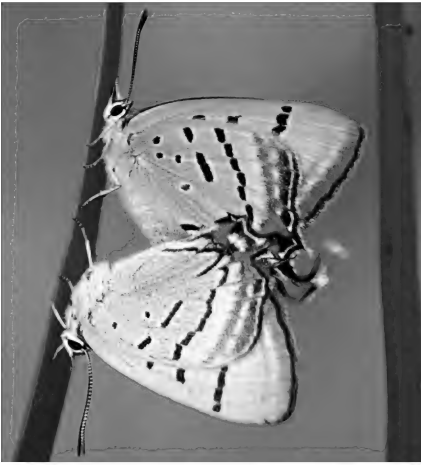
Our undulating property, ranging between 790-840 metres above sea level, was previously part of a 300-acre property and had carried beef cattle on our two kikuyu paddocks for about 100 years. Approximately half of our 20 acres is remnant warm temperate and sub-tropical rainforest that has been logged. It is now protected by a Conservation Agreement.

In the second half of 2005, with the cattle gone, a few *Acacia melanoxylon* began to regenerate slowly in the thickening kikuyu but we quickly learned they needed protection from wallabies. These young wattles (coupled with their resident ants) have encouraged Imperial Hairstreaks (*Jalmenus evagoras*) to breed here. Every few years the butterflies move their egg laying to newly emerging trees and we wonder where they will go when all our *A. melanoxylons* have grown too large?



Path through the plantings





Imperial Hairstreak (*Jalmenus evagoras*)

repeated each day as we check our young trees. With the growth of our trees comes climatic change in small zones such that we now have two Lowland Wet Tropics rainforest plants thriving for several years in sheltered positions – we have pushed the heavy white frost back in winter and our trees are warming our winters and cooling our summers!

Three years ago, we obtained a Jaliigirr Bush Connect grant to plant 650 trees which is helping us to join up our rainforest remnants with Junuy Juluum National Park thus forming new wildlife corridors. As our trees mature, the birds have come to help us by spreading local rainforest seeds. To date, Trev has planted around 2000 trees, some of which Carol propagated from seed gathered from our first pioneer plantings. Many of the trees are butterfly and moth food plants and caterpillars are already giving them a light prune.

We try to have a range of habitats for different species. Under a power line clearing where native grasses grow there is an established colony of the beautiful Silver Xenicas (*Oreixenica lathoniella*). They appear around late March every year and the

In winter 2005, with no mature trees at all over half our property, we first learned that frost was a major hurdle for us to overcome in creating rainforest at over 800 metres above sea level. Over our first twelve winters, we sheltered many young rainforest plants with frost protectors to ensure their survival. Our increasing number of fast -growing *A. melanoxylons* also created shelter as did other cold hardy species we used as pioneers. It was slow going for the first few years, but the result today is a mixture of warm temperate, sub-tropical and tropical rainforest flora thriving on our previous green kikuyu desert. The excitement gained from seeing our home-grown rainforest develop is



Silver Xenicas (*Oreixenica lathoniella*)



power company has strict instructions not to destroy this habitat. In the still open grassy areas of the paddocks, native grasses are also invading the kikuyu and large patches of Scaly Buttons (*Leptorhynchus squamatus*) have appeared. Their tiny yellow pom-pom flowers are favourites of small Skippers and Blues. In areas of dappled shade, the native grasses increasingly thrive too and it's here that the Browns, of which we have many species, love to fly in late summer and autumn.

The nectar garden is mainly Carol's job and this year the butterflies have swarmed to the many Buddleias planted around the edge of our lawn. We have a range of flower sizes and shapes to appeal to different species, including wallflowers, pentas, lavender, daisies, natives and forget-me-nots which flower in late winter – the Macleay's Swallowtails (*Graphium macleayanus*) love them. Most other butterflies disappear during the colder months but the Macleay's and Black Jezebels (*Delias nigrina*) remain quite common all year. Butterflies are also attracted to the flowers of a *Parsonsia straminea* vine on a fallen tree.



Ornate Ochre (*Trapezites genevieveae*)



Orange-tipped Pea-Blue (*Everes lacturnus*)

This year for the first time we had quite a few Yellow-spotted Jezebels (*Delias nysa*) feeding on Buddleia flowers and many Yellow Albatross (*Appias paulina*) in mid-summer. Other less common visitors, or first sightings, have been the Ornate Ochre (*Trapezites genevieveae*), Scarlet Jezebel (*Delias argenthona*), Orange-tipped Pea-Blue (*Everes lacturnus*), Pale Triangle (*Graphium eurypylus*), Eastern Dusk-flat/Common Red-eye (*Chaetocneme beata*) and the Orange Swift (*Parnara amalia*).

This summer, also for the first time, we spotted *Macroglossum micacea*, one of the bee-hawk moths, feeding on Buddleia early in the mornings. They zip around so quickly and their wings beat so fast we found it difficult to get a clear photograph of them in flight.

**Spreading the word:** We have found there is an interest in the NSW Mid North Coast community for information on butterflies and moths and have given several



presentations on our sightings. We have been asked to do three more this year. We have put some of our photographs on a website, <http://butterfliesdorrigio.weebly.com/>, detailing the 84 species of butterflies (and a few of the moths) we have seen here. We have included on our website our sightings of 40 Hawk Moths from the east coast of NSW and FNQ as these are a particular interest of ours. Many more to go to reach 65 – the current known number of Australian Hawk moth species! On our property, the number of sightings to date is 21.

We have noticed a huge increase in the numbers and species of birds, reptiles, butterflies and moths (in fact all invertebrate life) as the tree cover on our property has expanded. We keep records of our Lepidoptera sightings, our existing flora and our progressive plantings. We feel we are making a small contribution to preserving habitats and repairing the environmental damage we humans have done to the earth.

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## **New Distribution Records for Polyommata Butterflies (Lepidoptera: Lycaenidae) in Australia, including Biological Notes. Part IV – *Theclinesstes*, *Lampides* and *Zizula* – Kelynn L. Dunn**

### **Summary**

This paper lists ten new and important locations in mainland Australia for four species of butterflies from three polyommata genera, *Theclinesstes* Rober 1891, *Lampides* Hübner 1819, and *Zizula* Chapman 1910 (Lepidoptera: Lycaenidae: Polyommatae). These species comprise *Theclinesstes miskini* (T.P. Lucas 1889), *T. serpentata* (Herrich-Schäffer 1869), *Lampides boeticus* (Linnaeus 1767) and *Zizula hylax* (Fabricius 1775). Notes provided for selected records offer insight into the ecological circumstances of the encounters, details of any voucher specimens, as well as any taxonomic issues where these exist, and the discussion considers the significance of the sites in terms of the species' broader distributions.

### **Introduction**

This final part on the polyommata butterflies expands knowledge of the distribution of several more species in remote parts of Australia. The species covered comprise *Theclinesstes miskini* (Wattle Blue) (Fig. 1), *T. serpentata* (Saltbush Blue) (Fig. 2), *Lampides boeticus* (Long-tailed Pea-blue) (Fig. 3) and *Zizula hylax* (Dainty Grass-blue) (Fig. 4). The illustrations show the adults in the field but not necessarily at the sites concerned (see captions). The paper records the results from several field trips (from Victoria); namely, to central Cape York Peninsula, Queensland (in January 2002), to the Eyre Peninsula, South Australia (in the springs of 2007 & 2008), to southern Western Australia (in spring 2008), and to western and northern Queensland (in the springs of 2011 & 2012). The spellings of the scientific names align with Braby (2000), the main source used for this distribution-focused study; the spellings of the common names are the contemporary ones (derived from Braby 2016).



Methods

The first part of this series on polyommatuses outlined the means used for routine data gathering to increase the tally of species seen at the places inspected (see Dunn 2017a). Use of a semi-structured approach to survey meant that there would be less reliance on serendipity and more emphasis on probability. The same approach helped gather the records included in the second and third parts (Dunn 2017b, c), as well as this fourth instalment. The first part also discussed the criteria used to underpin the validity of the identifications, with examination of specimens in the hand being the favoured approach for this group because of their small sizes and similar appearances (see Dunn 2017a). An earlier piece on the thecline lycaenids outlined the means used to measure distances from fixed points (see Dunn 2016 and relevant references therein) and that approach applies to this series as well.

Results

The table lists four species from ten new locations (arranged from north to south) across northeastern and southern Australia. All sites fall outside (or if not, then very close to) the boundaries defined or inferred by Braby (2000) for the species concerned and so are new or interesting on that criterion. A superscript indicates that field notes offer additional insight into particular records. These notes are anecdotal and may include references to encounters by other workers in the last decade or so, where their published new locations fall close to those listed in this report. They often discuss the ecological circumstances of the encounters, and one or more historic references may augment these where that content offers insight into taxonomic matters. The times of the observations are in Australian Eastern Standard Time (AEST), South Australian Time (SAT), and Western Standard Time (WST), where applicable. Voucher specimens are held in the Australian National Insect Collection, ACT (ANIC), the Victorian Agricultural Insect Collection, Vic. (VAIC), and the author’s holdings (KLDC).

Table: New locations for polyommatusine butterflies from beyond their known ranges in Australia

Species/Location	State	Geocode	Date	Format
<i>Theclines thes miskini</i>				
Mount Inkerman summit, 24 km SSE of Ayr	Qld	19°45’S, 147°30’E	02 Nov 2012	Voucher <sup>Note 1</sup>
Wirrulla	SA	32°24’S, 134°32’E	27 Nov 2008	Voucher <sup>Note 2</sup>
Minnipa	SA	32°51’S, 135°09’E	23 Oct 2007 27 Nov 2008	Obs. <sup>Note 3a</sup> Voucher & DNA <sup>Note 3b</sup>



***T. serpentata***

Eastern Creek crossing, 91 km by road NW of Julia Creek	Qld	20°06'S, 141°09'E	09 Oct 2012	Voucher <sup>Note 4</sup>
18 km (beeline) SE by E of Winton, near mesa (at 'site 4')	Qld	22°28'S, 143°12'E	05 Oct 2012	Voucher <sup>Note 5</sup>
23 km by road W by S of Muttaborra	Qld	22°38'S, 144°22'E	04 Oct 2012	Voucher
22km by road S by W of Wyandra	Qld	27°27'S, 145°57'E	24 Oct 2011	Obs.
11 km by road SE by E of Cunnamulla	Qld	28°07'S, 145°46'E	27 Sep 2012	Voucher

***Lampides boeticus***

Beacon Hill Lookout, 1.6km E of Norseman	WA	32°12'S, 121°49'E	10 Oct 2008 13 Oct 2008	Voucher-DNA <sup>Note 6</sup> Voucher
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***Zizula hylax***

80 km by road SE of Weipa (at 80 km road marker)	Qld	12°49'S, 142°24'E	07 Jan 2002	Voucher
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**Key to Table:**

**Note 1.** A single male of *T. miskini eucalypti* was taken whilst hill-topping in shrubby-woodland admixed with patchy dry vine thickets during sunny weather, between 1445-1520 h (AEST). A second visit on 6 May 2015 yielded a few more males, all found perched on summit foliage between 1215 and 1410 h (duration of visit). Of these, one was taken 5-6 m above ground whilst perched on a Queensland Bottle Tree (*Brachychiton rupestris*; Malvaceae) – which, from memory, was not blossoming – on the very summit at 1220h; the remainder were perched on a small shrub about 2-3 metres above ground. A short inspection of a blossoming Boonaree tree, *Alectryon oleifolius* (subsp. *oleifolius*) (Sapindaceae) growing about 30 m away to the south, at the car park, provided no evidence of any visiting *T. m. eucalypti* that day. Instead, two adults of *Euploea corinna*, two of *Tirumala hamata*, two of *Acraea andromacha*, a male of *Hypolimnys bolina* (all Nymphalidae), a few males of *Nacaduba biocellata* and a solitary female of *Zizina otis* (both Lycaenidae) were foraging at its flowers on the May visit. (The same flowering tree had attracted just a single female *Badamia*



*exclamationis* (Hesperiidae) in November 2012, suggesting limited blossoming at that time.)

Later, on 5 June 2015, many males of *T. miskini* were encountered on the summit. Most secured proved to be *T. m. eucalypti* whilst one taken appears to belong to the nominate subspecies. The latter specimen is similarly colour-toned above to the arid-inland form 5, which is widespread in northwestern Queensland; Sibatani and Grund (1978: 20) gave evidence of its presence (regularly or occasionally) in coastal northeastern Qld between Ayr and Bowen. Three individuals of subspecies *eucalypti* were photographed whilst perched on a small tree, probably *Guioa acutifolia* (Sapindaceae), between 1410-1500 h, and after a suitable image was obtained, each was then captured and labelled as vouchers 1-3 to underpin their field identifications – Fig. 1 being the third example).

Almost no flowers were present on the Boonaree tree in June and just the one small lycaenid – almost certainly *N. biocellata* – but which evaded capture to confirm this identification beyond any doubt, was feeding about 4 m above ground. Its fluttering flight behaviour aligned with that species, and there was no evidence of any *Prosotas* or similar looking kinds on the summit on that or earlier visits (and so eliminating any differential diagnoses). On that visit in June the large Bottle Tree was (actually) flowering; its blossoms attracting two foraging males of *Cressida cressida*, a female of *Papilio aegeus* (both Papilionidae), and a single *E. corinna* but no *T. miskini* were seen to forage. There was also no attraction of *T. miskini* to the Boonaree tree on any of the visits, and yet an allied species, *A. diversifolius*, which occurs in the western dry vine scrubs, is a known larval host of the butterfly elsewhere (Moss 2005: 12). The details underpinning that host usage remain unpublished but Moss (pers. comm.) has since clarified that he personally found juveniles of the nominate subspecies of *T. miskini* on it in the Boonah-Kalbar region and on the western Darling Downs in southeastern Queensland (where, in both regions, form 2 of the species occurs – see Sibatani & Grund 1978). Boonaree may not be a larval host of the northern coastal subspecies *eucalypti*, which is probably ecologically, if not taxonomically, distinct.

- Note 2.** Three males of *T. miskini* were taken flying around blossoming wattles in shrubby open woodland between 1630 to 1640 h (SAT) (duration of visit). They were patrolling in company with *N. biocellata*, a species that was prolific at the time. Of the three adults of *T. miskini* retained, one was dry mounted and the other two were preserved in ethanol as DNA samples (currently cryogenically stored in the ANIC: vials B137 & B138); in addition, a companion male of *N. biocellata* was preserved in vial B136.



- Note 3a.** An adult of *T. miskini* was seen feeding at 1310 h (SAT) in company with adults of *Pieris rapae* (Pieridae) and *N. biocellata* at flowers of a decorative *Westringia* species growing near a damp soak in parkland in the ‘Womens Garden’, in the Minnipa township. **(3b.)** A few males of *T. miskini* were taken whilst perched and patrolling garden flowers on a subsequent visit to the same site (on 27<sup>th</sup> Nov) between 1800 and 1815 h SAT (duration of visit). Although the ‘Womens Garden’ (as local signage indicated) is not marked on Google Maps™ and may be colloquial, I recall the fine location was close to the railway station and the Minnipa hotel. One or more *T. miskini* were dry mounted and two males were preserved in ethanol as DNA samples (currently cryogenically stored in the ANIC: vials B144 & B145).
- Note 4.** An adult of *T. serpentata* was netted at a flower of *Amyema sanguinea* (Loranthaceae) growing on a low bough of a massive eucalypt in riparian woodland within the broader savannah country. It fed in company with a few unsexed *Papilio demoleus* (Papilionidae), a few unsexed *Eurema smilax*, an intermediate dark form female of *Belenois java* (both Pieridae), several males and one female of *Ogyris amaryllis* (Lycaenidae), and one unsexed *T. miskini* (the ‘arid inland’ form 5 – as per Sibatani & Grund 1978: 20) between 1155 and 1315 h (AEST) (duration of visit). The epicortical runners, a notable feature of this mistletoe species (and absent in most other *Amyema* spp.), assisted the identification of the nectar source in the field; evidence of six foraging butterfly species at its flowers suggests that when in bloom, *A. sanguinea* is an important nectar source for various species in the northern half of Australia. No other flowers were conspicuous in the general area and so few butterflies were to be seen elsewhere; indeed, only a single *Junonia villida* (Nymphalidae) and a few *Z. otis* were detected during the 20 minute inspection of the broader area and these two were found flying among herbs along the river bank some 30 metres away.
- Note 5.** An old adult of *T. serpentata* was taken at a flower of Grey Mistletoe, *Amyema quandang* (Loranthaceae) in woodland at the base of a mesa at 22°27’55”S 143°11’35”E between 1645 and 1700 h (AEST) (duration of visit), an area which I designated locally as ‘site 4’ in my field notes. It fed at this mistletoe in company with one or more adults of *N. biocellata* and an intermediate dark form female of *B. java*. *T. serpentata* appeared to be rare in the region at that time as a search that same day at two areas nearby (site 2: 22°28’43”S, 143°11’07”E & site 3: 22°28’01”S, 143°11’30”E) revealed no others. Reduced flight activity during late afternoon is a curious feature I have seen broadly in the tropics in the Asia-Pacific region and which Van der Poorten and Van der Poorten (2016) have suggested may be a strategy to avoid predation during the peak feeding times of the local birds. Nonetheless, that late hour of the day was not likely to have contributed to its





low profile as this ground dwelling species, even if roosting at dusk, is easily disturbed when present in numbers (which it often can be).

**Note 6.** An old male of *L. boeticus* taken at the lookout was preserved in ethanol as a DNA sample (currently cryogenically stored in the ANIC: vial B010). It was flying in company with a male of *T. serpentata* and a female of *Z. otis* between 1400 and 1430 h (WST) (duration of visit), both of which were also preserved in vials B011 and B012, respectively.

## Discussion

Although all of the records tabled are from locations that fall beyond or near the boundaries of the species' distributions, as interpreted from the range-fill maps provided by Braby (2000), most of these sites are now within the enlarged distributions proposed for the species concerned in the recent field guide on the Australian fauna. The constraints and purposes of a field guide, which aim for brevity, mean that most of the locations underpinning the new and often broad range extensions that work included were left unstated. For that reason then, the synoptic maps by Braby (2016) indicate where we might expect species to occur – and in this they predict well – whereas the earlier maps from 2000 aligned more with where the species have been found (Dunn 2017c, d). The maps from 2000 can be deconstructed (in part) by comparison with the locations in the text, which enables advancement of knowledge by allowing for the addition of spatial information believed to be new.

The presence of males of *Theclines thes miskini eucalypti* outside of its known range and within the range of the nominate subspecies offered a surprising encounter on Mt Inkerman. That location, at 220 m a.s.l., now provides the southernmost report for this subspecies in coastal northeastern Queensland and reveals another area of sympatry with the nominate subspecies. I have found the two subspecies to be sympatric at times (but not often) on Mount Stuart and Castle Hill, Townsville, where they remain phenotypically discrete (Dunn 1999). In that article (p. 58), I had remarked in passing that, “No hybrid populations have been documented in spite of a large area of potential racial interaction in what seems a continuous distribution in north eastern Queensland.” The synoptic ranges that Braby (2016) proposed for these two forms (as subspecies) show clear separation, an implication that is diagrammatic rather than realistic (cf. commentary by Braby 2000). Although this sympatry may be underpinned by vagrancy (and perhaps nothing more than very irregular), it still raises interesting speculation as to whether the subspecies *eucalypti* may be a separate species, given its very different appearance. Complicating this as Edwards *et al.* (2001: 190) have pointed out, the lectotype chosen by Waterhouse (1913) for the taxon ‘*onycha*’ is an example of *eucalypti*. This raises a serious question over the future legitimacy of the contemporary usage of the name *eucalypti* for that form as it is reasonable to assume that that historic designation ought to be treated as a valid decision based on primacy (according to the Zoological Code of Nomenclature)



unless there has been a ruling countering this. Yet correcting this may throw the *miskini-onycha* group into chaos (Dunn & Dunn 2006) and result in much misinformation and mistaken association of older information on these species by field enthusiasts who remain unaware of the earlier complex taxonomic history.

The nominate populations of *T. miskini* at Wirrulla and Minnipa on northern Eyre Peninsula are now within that broader range implied for this species in South Australia (Braby 2016). That revised distribution includes the western half of the Eyre Peninsula broadly through the eastern half of the Great Australian Bight to the Head of Bight, SA (Grund 2007) at the westernmost limit. Thereafter there is seemingly an absence of records through to Cape Arid National Park, WA (Field 1990) from where sporadic records extend westward again. Curiously, the 2016 map for this species omits Kangaroo Island, SA where Mayo (1987) and Young (2004) have recorded the species. Although the first paper reported the species flying around the host of *T. albocincta* (which raises some concerns) and the last encounter was not specimen-backed (and is weaker because of that), I have not heard that these identifications are mistaken; if, however, they are erroneous a formal statement to that effect is required.

The current range-fill map for *Theclinesstes serpentata* is worthy of scrutiny because of the enormous change in that species' distribution between the map by Braby (2000) and the recent proposal in 2016. This species' presences at the four locations tabled were all well outside its known occurrence in western Queensland at the times of those encounters. However, all populations except for the northernmost one at Eastern Creek crossing now lie within the broader range that the revised synoptic map offers (Braby 2016); the revised range extends broadly southward from an arbitrary line lying to the south of the 20-degree parallel of latitude. There is also a slight anomaly at the eastern coast; there the range extends a little northward, to just north of Townsville (Woodger 1990). Additional records of *T. serpentata* from much of the inland of northern Australia are required to uphold that proposed line of demarcation across the continent, as material evidence is very rare in collections and there are few reports in the literature that support it. Indeed, the record from 10 km SW of Mulan, near Lake Gregory, at 20°09'S 127°31'E (Pierce 2008) and the new one tabled from Eastern Creek (at lat. 20° 06'S) appear to be the only evidence of its presence close to that parallel of latitude in inland Australia! Thus, the species' occurrence across broad areas including the Great Sandy Desert in northwestern Western Australia and the Wauchope region in central Northern Territory, although likely to be upheld over time, would appear to hinge more on prescience than reality. Indeed, the northernmost report from the Northern Territory (that I know of) lies to the south of the 22<sup>nd</sup> parallel of latitude (as plotted on the map from 1991 reproduced by Dunn & Dunn 2006), a spatial shortfall in excess of 200 km. For the present, the new locations in the table offer that small step towards legitimising that arbitrary northern boundary on the map by Braby (2016).



The current range-fill map for *Lampides boeticus* offers major change in that species' distribution between the map by Braby (2000) and the recent revision in 2016. As a result, the evidence of its presence on the eastern outskirts of Norseman, WA now falls within the broader distribution proposed for this migratory species. The record to the south from Cape Le Grand National Park, WA (Williams *et al.* 1996), which Braby (2000) had overlooked, has been included in the revised distribution of 2016. However, there would seem to be no other records from along the coastal region until reaching that eastern location near Whyalla, SA that McQuillan and Fisher (1985) reported. Additional records of *L. boeticus* from much of the coastal region of the Great Australian Bight and extensively inland (almost to the SA-NT border) – a vast area of southern Australia – are required to better support that supposed southern continuity. This is because, as with other examples, records from the desert areas are very rare in collections and are sparse in the scientific literature.

The current range-fill map for *Zizula hylax* by Braby (2016) now includes central Cape York Peninsula south along the coast to within the township of Weipa, which that spatial evidence by Hancock and Monteith (2004) underpins. The new record to the east at the 80 km roadside marker on the Peninsula Developmental Road offers a southern inland boundary location for the butterfly on the peninsula. It adds detail to that portrayal of this species' wider distribution and helps support the new map for that area of far northern Queensland.

The ten locations offered for the species concerned in this final part of the series on polyommatus add to the knowledge of the spatial distribution of these smaller butterflies across Australia. None of these records would appear to link into range-creep associated with seasonal or longer-term climate changes but, instead, all present as part of these widespread species' usual occurrences. That clarified, a lack of exploration by insect collectors across the seasons in the outback of Australia is explanatory (Dunn and Dunn 2006); more surveys in remote and inland areas can only serve to strengthen the spatial knowledge for these species and many other polyommatus butterflies over time.

### Acknowledgements

John T. Moss (Qld.) identified the *Alectryon* and *Guioa* species from photographs of the flowers and foliage, and offered helpful suggestions to improve the manuscript in places. (The author identified the other plants mentioned.)

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- Fig. 1. *T. miskini* ssp. *eucalypti* male under side – Mt. Inkerman summit, Qld perched on a species of *Guioa*, probably *G. acutifolia*, 5/6/2015 (photo voucher no. 3; KLDC).
- Fig. 2. *T. serpentata* male under side – Truganina Swamp, Altona, Vic. feeding at flower of *Atriplex* sp. (Amaranthaceae) (host det. JT Moss).
- Fig. 3. *L. boeticus* male upper side – 1.5 km ENE of Warneet, Vic. feeding at pea flower, probably an exotic *Crotalaria* sp. (Fabaceae) (host det. JT Moss).
- Fig. 4. *Z. hylax* female under side – Magela Creek, Cahills Crossing Road, NT (image ex – video frame).
- Photos by Kelvyn Dunn



## **Mistletoe Profile – extract from *The Mistletoes of Sub-tropical Queensland, New South Wales and Victoria* by John T. Moss and Ross Kendall**

### **Fleshy Mistletoe *Amyema mirabilis* subsp. *boormanii***

#### **Description**

This small, erect, clumping, hyperparasitic mistletoe usually has bright green, fleshy, opposite leaves (to 10 cm long and 1.5 cm wide) with rounded apices and tapered bases. It also has red juvenile leaves and growing tips. The flesh-red flowers are in triads with the middle one sessile and most have magenta (dark red to purplish-black) bases just above the green calyx. Some flowers can have red bases and green tips. The shiny yellow fruit (to 10 mm) are ellipsoidal and constricted at the base with a raised circular residual calyx often with a residual style.

#### **Habitat and Host Plants**

Widespread in semi-arid and savannah woodland in scattered populations, this mistletoe is frequently parasitic on other mistletoes, especially the Bronze Mistletoe (*Amyema miquelii*) and Drooping Mistletoe (*Amyema pendula* subsp. *longifolia*) and on *Santalum* species (root parasites). It is also known to use *Allocasuarina* and *Eremophila* species. In September 2010, at Bowra Station, near Cunnamulla in southwestern Queensland, John, in company with Margaret Greenway, found this species in abundance, hosted by Wilga (*Geijera parviflora*), Whitewood (*Atalaya salicifolia*) and Ironwood (*Acacia excelsa*). Later (in October 2015) John found this mistletoe on Scrub Wilga (*Geijera salicifolia*) in the same location.

#### **Butterflies and Moths**

- Scarlet or Northern Jezebel (*Delias argenthona*)
- Black or Common Jezebel (*Delias nigrina*)
- Satin Azure (*Ogyris amaryllis meridionalis*)

#### **Notes**

In October 2009, John found an interesting form growing on *Pittosporum angustifolium* on the Thompson River at Longreach. It had one or two 10 to 16 mm peduncles from the leaf axils followed by two or three 5 to 10 mm rays (usually two) with flowers in both dyads and triads with the central flower sessile. Pedicels were 4 to 5 mm long. Bernhardt (1984) in his paper on mistletoes as hyperparasites, expands on the floral ecology of *Amyema mirabilis* and its host *Amyema miquelii*.

Common and Waterhouse (1972) list this mistletoe as host for the Bright Purple Azure (*Ogyris barnardi*), but Braby (2000) questions this. In the absence of subsequent confirmation, we consider it more likely that in this case this highly hyperparasitic species was actually parasitising *Amyema quandang*, a known host for this butterfly, whose larvae were actually feeding on the latter species.

Ross has newly recorded two jezebel butterfly species (*Delias nigrina* and *Delias argenthona*) utilizing this little known mistletoe, on two separate occasions, both at Upper Thane Creek, near Warwick in southern Queensland. Interestingly, at this site, this mistletoe was hyperparasitising two other *Amyema* species on eucalypts; *Amyema miquelii* in one case and *Amyema pendula* in the other, each previously known host plants for the same butterflies.





*Amyema mirabilis* foliage, buds and flowers

Photo Ross Kendall



*Amyema mirabilis* buds



*Amyema mirabilis* foliage, flowers and fruit

Photos John Moss



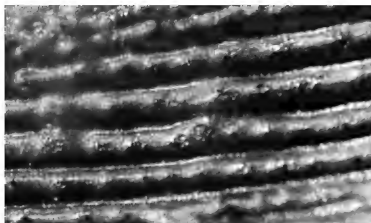
**A new host plant record – Ross Kendall**



The Mistletoe Day Moth (*Comocrus behri*) uses a number of mistletoe species as hosts. The Fleshy Mistletoe (*Amyema mirabilis*) had not been recorded as a host when, at Thane Creek near Warwick, Queensland in November 2017, I found a final instar larva of the moth feeding on this mistletoe.

Photo Ross Kendall

**UNDER THE MICROSCOPE**

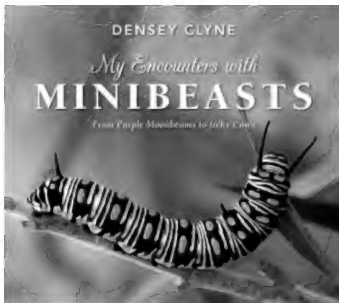


Are you able to identify this image?

See page 43 for the answer.

Photo Trevor Lambkin

**BOOK REVIEW**



**My Encounters with Minibeasts**

From Purple Moonbeams to Itchy Cows by Densley Clyne – New Holland Publishers Pty.Ltd. ISBN 978 1 92554 617 0 Paperback, 168 pp., 225 x 198 x 14mm RRP \$29.99 – Reviewed by *Alan Hyman*

In recent years there have been many books produced covering various invertebrate orders either singly or collectively – from field guides to substantial hardbacks. All are excellent in their own right. They identify individual species, give biological details, geographical distribution, habits and so forth in an assimilable but dry literary manner. By contrast, there is a newly published work by





well-known naturalist Densey Clyne who has the knowledge, experience and linguistic ability to communicate equally to the scientist or interested layperson. The specialist entomologist will find this book a refreshing alternative to the standard presentation. The non-specialist whose experience is perhaps limited to glimpsing a scurrying spider, a bug on a leaf or a colourful butterfly floating over the back fence will find its contents a series of insightful revelations. The work is a collection of thirty-five short accounts of her adventures over the years with various species of insects and spiders, sumptuously illustrated with first-rate photography. The various chapter titles are often clever alliterations, or a play on words of well-known expressions, setting up an amenable approach to the book while in no way diminishing the substance. Preceding the first chapter, a rather beautiful photograph of a black fly – with a few coloured sugar granules on an otherwise white background, seems somehow metaphorical in tone for the material which follows. The eye-catching cover features a much-enlarged image of a Lesser Wanderer larva – resplendent in black with white bands and yellow spots.

The invertebrates covered are wide-ranging – including butterflies and moths, ants, katydids, wasps, plant bugs, spiders and others. All stories derive from her personal observation which involves much patience, perception, and understanding. ‘Secrets of the Web Site’ takes us into the fascinating world of the Net-casting spider (*Deinopis subrufa*). Densey gives us an over-the-shoulder view as it lives out its life in her glasshouse (‘..so let’s now follow one of these spiders and let her tell her own story’). There follows a comprehensive description of the net’s fabrication, ultimately becoming a rectangular trap to be cast onto unsuspecting prey such as native cockroaches. The complex net weaving, entrapment lures, capture techniques and mating rituals are all described here first hand. The chapter ‘Who Really Invented What?’ turns the premise – that humans thought up everything – on its head. Insects have applied principles of science and technology since time immemorial – admittedly with Nature’s guidance. Many examples are given, including paper making and pottery (various species of wasp who create pulp or mud nests); cold storage (honeypot ants deep in the ground); the snorkel (mosquito larvae taking in air through water surface); even Velcro (hooks on the abdominal feet of caterpillars). Time perhaps, for a little humility on our part. Butterflies feature prominently and the chapter entitled ‘Mistletoe and Friends’ deals with the relationship between the various mistletoe species and butterflies, especially the genus *Delias*. Included are fine images of the Black Jezebel (*D. nigrina*) in egg-laying mode, a Union Jack (*D. mysis*) just emerged from its chrysalis, an Imperial White (*D. harpalyce*) and a Red-spotted Jezebel (*D. aganippe*) plus a Southern Purple Azure (*Ogyris genoveva*) whose foodplant is the Weeping Mistletoe (*Amyema pendula*). (Incidentally, it appears that mistletoes are not necessarily the parasitic villains they’re often made out to be.)

Densey’s writing style has a delightful feeling of elegant, fluid prose. Take the description of the cicada’s song for example (Greengrocer, Floury Miller and Co.): ‘The sound is as familiar as the prickle of the heat and the summer mirage that lifts



*the trees to stand them on the shore of a non-existent lake'. A commentary on the process of metamorphosis (Butterfly Botanists) states: 'A butterfly spends most of its time as a short-sighted, wingless, leaf-guzzling caterpillar, negotiating the world by scent, defying gravity in the treetops, succulent prey to a host of enemies. Then after a period of apparent sleep, it wakes as a bright-winged, sharp-eyed imago, transported into a world of colour and sunshine and free flight and strange new urges'. As Densey says in her introduction: 'Writing these stories has given me almost as much pleasure as the encounters themselves. Since childhood, my two greatest interests have been the world of nature and the world of words .... English language and Australia's bountiful wildlife have remained equally close to my heart and a source of enduring enjoyment.'*

The book's page structure is based on a simple two-column grid format with occasional variations as content dictates. The text is set in a clean and legible 9 point serif typeface on a 14 point line space. Coupled with broad margins, the judicious use of white space endows a crisp and uncluttered effect allowing the text to be read easily. The chapter headings are set in a contrasting formal script with brief 8 point bold sans serif picture captions completing the book's typographic style.

The clear, close-up colour photography of living insects in natural surrounds is superb. For example, one can imagine the female Orchard Swallowtail's wings actually vibrating as it feeds on a flower cluster, see the bearded old man in sunglasses (male Net-casting spider), enjoy the static tableau of the weaver ants or ponder the almost abstract art in the detail of the Eucalyptus Emperor Moth and Long-tailed Bombyx Moth caterpillars. Study the twin bottlebrushes of the male Common Crow butterfly's scent dispensers and the cryptic patterning of the Tailed Emperor's wing undersides, a detail which would be seldom witnessed by the casual observer.

Recently, while I was raking leaves on a warm, tranquil autumn day, a slightly worn but still very active female Bank's Brown (perhaps the last of the season) suddenly alighted on a Eucalyptus trunk in front of me. It enjoyed a half minute or so basking in the sun before disappearing as quickly as it had arrived. I thought of Densey's stories – and this briefest of encounters. There was of course so much more to this butterfly's existence than those few, fleeting seconds – its birth, larval growth, metamorphosis, then perhaps dodging predators, mating and continuing its species' cycle ... a life in its own right which I shared momentarily. (It was a little like glimpsing the face of a stranger on a train passing in the opposite direction, never to be seen again.) Perhaps, therefore, 'MINIBEASTS' will encourage the reader to see and absorb more than just the moment... understanding and reflecting more deeply on the complexity and beauty of the natural world and realising that these small creatures are an integral part of the bigger picture. In the spirit of the chapter headings, the reader can be 'A Fly on the Wall', discovering the mysteries and marvels of



invertebrates, accessibly presented in Densey's lucid, intelligent and good-natured writing.

Ed.: Densey's book is available from the Club for \$29.99 plus \$13 P&H.

### SPECIAL PRICE ON BOOKS

For a limited time, we are able to offer to Club members, a special price for the following books

**A Guide to Beetles of Australia:** George Hangay & Paul Zborowski: CSIRO Publishing RRP \$49.99

**The Complete Field Guide to Dragonflies of Australia:** Gunther Theischinger and John Hawking: CSIRO Publishing RRP \$49.99

**The Complete Field Guide to Stick and Leaf Insects of Australia:** Paul D. Brock and Jack W. Hasenpusch: CSIRO Publishing RRP \$49.99

Special Price **\$25 each** plus \$13 P&H

### YOU ASKED



This moth is about 1cm long. It flew around for a few minutes before settling on an Agapanthus leaf. It has some very distinctive markings. I have no idea where to look for an ID.

Harold McQueen, Goodna, Queensland

Peter Hendry provided one – “I believe it is an *Epicephala* sp. Gracillariidae; Gracillariinae.

This has just come through on IndoPacific Moths from Roger Kendrick who agrees with my diagnosis.

There must be a Phyllanthaceae plant (or plants) close by, as the species in *Epicephala* are all symbionts with Phyllanthaceae (adults pollinate, larvae feed on flowers & fruit). The IndoPacific site says it is also a pollinator of *Glochidion ferdinandi* and *G. sumatranum*, the cheese trees.

e.g. <https://www.ncbi.nlm.nih.gov/pubmed/21652364>

Obligate pollination mutualism in Breynia (Phyllanthaceae: further...

Am J Bot. 2004 Sep;91(9):1319-25. doi: 10.3732/ajb.91.9.1319.

ncbi.nlm.nih.gov”

### REPORTS

#### **Invertebrate Survey of the Samford EcoCorridor – Ross Kendall**

On February 18<sup>th</sup>, 2018, several members of the Butterfly & Other Invertebrates Club teamed up with members of the Samford EcoCorridor Team to conduct an invertebrate survey in the EcoCorridor.



Details of the corridor project were published on page 35 of the December 2017 edition of Metamorphosis. The results achieved thus far are quite impressive.

We spent an enjoyable and productive two hours together with the results of the survey summarised in the following table prepared by Peter Storer from the EcoCorridor team.

Photos Peter Storer



Insect Surveyors



Golden Digger Wasp (*Sphex ermineus*)

**Invertebrates observed at Samford Eco-Corridor- February 18<sup>th</sup>, 2018**

Common name	Latin name	Notes
<b>Bees and wasps (Apocrita)</b>		
Green Carpenter bee	<i>Xylocopa (Lestis) aeratus</i>	
Golden Digger Wasp	<i>Sphex ermineus</i>	Digging burrow near picnic table.
<b>Beetles (Coleoptera)</b>		
Fig leaf beetle		On sandpaper fig
Net-winged Beetle	Licidae (family)	
Leaf beetle	Chrysomelid	On Hairy Bird's Eye ( <i>Alectryon tomentosus</i> )
<b>Bugs (Hemiptera)</b>		
Mallotus Harlequin bug	<i>Cantaoparentum</i>	Nymphs on Green Kamala ( <i>Malloris claoxyloides</i> )
Treehopper		
<b>Butterflies (Lepidoptera)</b>		
Common Eggfly	<i>Hypolimnastolina</i>	A few adults seen
Wattle Blue	<i>Theclinessthes miskini</i>	One adult caught
Common Moonbeam	<i>Philiris innotatus</i>	Larvae on ( <i>Ficus fraseri</i> ). Distinctive eating pattern
Blue Triangle	<i>Graphium sarpedon</i>	Several adults seen, especially near laurels
Lemon Migrant	<i>Catopsilia pomona</i>	Two adults
Symmomus Skipper	<i>Tappezites symmomus</i>	
Common Grass Yellow	<i>Eurema hecabe</i>	Several adults seen



Evening Brown	<i>Melanitis leda</i>	Adult in planting. Caterpillar feeding on green panic
Common Aeroplane	<i>Phaedyra shepherdii</i>	A few adults seen
Orchard Swallowtail	<i>Papilio aegaeus</i>	A few males and one female seen
Blue tiger	<i>Tirumala hamata</i>	A few adults seen
Clearwing Swallowtail	<i>Cressida cressida</i>	A few adults seen
Common Crow	<i>Euploea core</i>	Several adults seen
White-banded Lineblue	<i>Nacaduba kurava</i>	A few seen. Host Muttonwood ( <i>Mysine variabilis</i> )
Cabbage White	<i>Pieris rapae</i>	One adult seen
Pearl White	<i>Elodina</i> sp.	Could not be identified to species while in flight
White-brand Grass Dart	<i>Sumiana sunias</i>	Adults near picnic site
<b>Dragonflies and Damselflies (Odonata)</b>		
Wandering (Red) Percher	<i>Diplacodes bipunctata</i>	Perched on grass stems
Australian Tiger	<i>Ictinogomphus australis</i>	Unconfirmed, but likely species
<b>Flies (Diptera)</b>		
Robber fly	Asilidae (family)	
Unknown fly		Photo by Lotty
<b>Moths (Lepidoptera)</b>		
Pyrilid moth	Family Pyralidae	On Deep Yellowwood
Hawk moth	Family Sphingidae	Evidence of larval droppings on <i>Lomandra hystrix</i>
<b>Spiders (Arachnida)</b>		
Unknown spider		Photo obtained

\*\*\*\*\*

## Annual General Meeting – 14<sup>th</sup> April 2018, Indigiscapes, Capalaba

Dawn Franzmann

There is always a danger in asking someone to write a report on a meeting or event when one has been involved in organising same. When Daphne asked me to write a report on the AGM I was thinking from my perspective, of course, that it was a perfect/great meeting.

As always it is good to catch up with members who for one reason or another, can't make our quarterly meetings, at the same time they are still actively involved behind the scenes by contributing to our magazine, posting beautiful photos on our Facebook Page or assisting at stalls on Festival days.



Twenty-one members and two visitors were in attendance. Ross delivered his President's Report in which he commented that our magazine "Metamorphosis Australia" remains at the core of the club. There is no doubt that this publication would not exist without the tireless efforts of our Editor, Daphne Bowden, and the many members contributing articles, information and photos.

Items of interest were – our successful application to the Dept. of Fair Trading for the updating of our Constitution, the new club Banner and details of our Photo Competition for Years 9–12 students.

Darren Shepherd, Principal of the Toohey Forest Environment Centre (ECO Centre), has been the guiding force in getting this Competition up and running. The Competition is a joint venture between BOIC and the ECO Centre. Committee members have been working on the planning of the competition, ending with the presentation of prizes after our 11<sup>th</sup> August meeting at the ECO Centre. We have been very lucky in that we have been able to access their meeting room and labs during the past year.

The 2018 Committee is pictured below.



From left – Ross Kendall, Denise Turnbull, Daphne Bowden, Dawn Franzmann, Peter Exton, Rob MacSloy, Richard Zietek, John Moss

Photo Bernie Franzmann

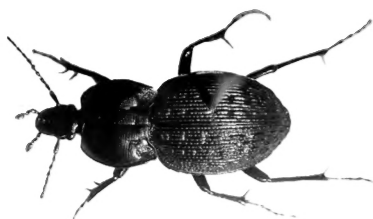


After the formal component of the meeting, Dr Christine Lambkin, Curator of the Entomology Collection at the Queensland Museum, delivered a very informative and interesting talk about the achievements of the Museum during recent years. Christine also had available for us to peruse many display boxes containing some amazing specimens.

To make things even more entertaining, Daphne had organised a Round Robin lucky number draw. Many lovely prizes were taken home by us all. The Committee also had a display of some of our books and some lovely invertebrate inspired jewellery for sale. Daphne had sourced these items for the Club to sell and make our displays at Festivals a little more attractive.

## UNDER THE MICROSCOPE

And the answer is .....



A section of the carapace of a ground beetle (Family Carabidae) from Mt Tamborine rain forest.

Can anyone also give us an ID on the insect?

Photo Trevor Lambkin

## BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

### Planning and General Meeting

**What:** Our quarterly planning meetings are informative and interesting and we welcome members to contribute to discussion. This will be followed by the presentation of prizes for the student photo competition.

**When:** **Saturday 11<sup>th</sup> August 2018 at 10 am**

**Where:** The Eco Centre, Griffith University campus.

**What to bring:** Enthusiasm is welcome. Morning tea will be provided.

**If attending, please respond to** Dawn Franzmann (ph 3325 3573; 0419 786 369 email [berndawn@gmail.com](mailto:berndawn@gmail.com))

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### 2018 Native Flower Show and Plants Market

**What:** We will have a display at this event.

**When:** **Saturday 15<sup>th</sup> September and Sunday 16<sup>th</sup> September 2018**

**Where:** Brisbane Botanic Gardens, Mt Coot-tha

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## DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions, and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

## ACKNOWLEDGMENTS

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Butterfly and Other Invertebrates Club Inc.  
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**Next Club event: Planning and General Meeting - Saturday 11<sup>th</sup> August 2018 at  
10 am**

